

1 What is claimed is:

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3 1. An integrated glass ceramic system for providing internal
4 communications, comprising,

5 a plurality of glass ceramic components, one of the glass
6 ceramic components being a patterned component made of a
7 photostructurable glass ceramic material, the glass ceramic
8 components are coupled together for forming a support
9 structure,

10 operational devices supported by the support structure,
11 two of the operational devices are optical devices for
12 communicating an optical signal through one of the glass
13 ceramic material components providing an optical path along
14 which is communicated the optical signal, two of the
15 operational devices are electronic devices for communicating an
16 electrical signal through one of the glass ceramic material
17 components providing an electrical path along which is
18 communicated the electrical signal, and

19 an optoelectronic communications grid enabling
20 intercommunications of the electrical signal between the two
21 electronic devices along the electrical path and enabling
22 intercommunications of the optical signal along the optical
23 path and between the two optical devices.

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1 2. The system of claim 1 wherein,

2 the operational devices are selected from the group
3 consisting of electronic and electrical and photonic and
4 fluidic and microelectromechanical systems devices.

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6 3. The system of claim 1 wherein,

7 the electrooptical communications grid comprises an
8 electronic and electrical communications grid and an optical
9 communications grid, the optical communications grid comprising
10 a free-space optical communication path through one of the
11 glass ceramic materials.

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13 4. The system of claim 1 wherein,

14 the patterned components are direct-write laser milled
15 components, photolithographic exposed and baked and etched
16 components, and direct-write laser exposed and baked and etched
17 components.

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19 5. The system of claim 1 wherein,

20 the operational devices comprise photonic devices for
21 communicating optical signals through the optical
22 communications path.

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1 6. The system of claim 1 wherein,

2 the operational devices comprise photonic devices for
3 communicating optical signals through the optical
4 communications path, the photonic devices selected from the
5 group consisting of optical transceivers and optical
6 transmitters and optical receivers and optical detectors and
7 mirrors and splitters and reflectors, polarizers and lenses and
8 optical fibers.

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10 7. The system of claim 1 wherein,

11 one of the glass ceramic components is a molded component.
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13 8. The system of claim 1 wherein,

14 one of the glass ceramic components is an annealed
15 component.
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17 9. The system of claim 1 wherein,

18 one of the glass ceramic material components is a tempered
19 component.
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1 10. An integrated glass ceramic system for providing internal
2 communications, comprising,
3 a molded component made of a photostructurable glass
4 ceramic material,
5 a patterned component made of a photostructurable glass
6 ceramic material, the molded component and patterned component
7 are coupled together for forming at least part of a support
8 structure,
9 electrodevices encapsulated within and supported by the
10 support structure,
11 optodevices encapsulated within and supported by the
12 support structure, and
13 an electrical communications grid for enabling
14 intercommunications between the electrodevices devices, and
15 an optical communications grid for enabling optical
16 intercommunications between the optodevices.

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18 11. The system of claim 10 wherein
19 the electrodevices are selected from the group consisting
20 of electronic, electrical and microelectromechanical systems
21 devices,
22 the optodevices are elected from the group consisting of
23 optical transceivers and optical transmitters and optical
24 receivers and optical detectors and mirrors and splitters and
25 reflectors and polarizers and lenses and optical fibers.

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1 12. The system of claim 10 wherein,

2 the support structure provides an optical path within the
3 optical communications grid.

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5 13. The system of claim 10 wherein,

6 the support structure defines a housing encapsulating the
7 electrode devices and optodevices.

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9 14. An integrated glass ceramic system for providing internal
10 communications, comprising,

11 patterned components made of a photostructurable glass
12 ceramic material, the patterned component are coupled together
13 for forming a support structure, one of the patterned
14 components is a molded patterned components, one of the
15 patterned components is a tempered patterned component,

16 electrode devices encapsulated within and supported by the
17 support structure,

18 optodevices encapsulated within and supported by the
19 support structure,

20 an electrical communications grid for enabling
21 intercommunications between the electrode devices, and
22 an optical communications grid for enabling optical
23 intercommunications between the optodevices and for enabling
24 the external communications, one of the components provides an
25 optical path within the optical communications grid.

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1 15. The system of claim 14, wherein
2 the electrode devices and optodevices comprise a sensor.
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4 16. The system of claim 14, wherein
5 the support structure defines a housing encapsulating the
6 electrode devices and optodevices.
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8 17. The system of claim 14, wherein,
9 the support structure defines a housing and provides an
10 optical communications path for enabling the external
11 communications.
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13 18. The system the claim 14 wherein,
14 the optical communications grid comprises a free-space path
15 through one of the patterned components.
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17 19. The system of claim 14 wherein,
18 the electrical communications grid comprising a conducting
19 feedthrough path through one of the patterned components.
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